



LERF

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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

July 21, 2000

Mr. Michael Thompson  
U.S. Department of Energy  
P.O. Box 550, MSIN: A5-15  
Richland, Washington 99352

RECEIVED  
AUG 10 2000

EDMC

Dear Mr. Thompson:

Re: Liquid Effluent Retention Facility (LERF) and Unsaturated Zone Monitoring Alternatives

The Washington State Department of Ecology (Ecology) received a document entitled "Environmental Monitoring Alternatives for the Liquid Effluent Retention Facility" (PNNL-12024, M.D. Sweeney, November 1999). It is Ecology's understanding that the document was generated to examine alternatives for future compliance with Washington Administrative Code (WAC) 173-303-650(2)(b) unsaturated zone monitoring requirements. Ecology granted the U.S. Department of Energy (USDOE) a variance from certain interim status groundwater monitoring requirements at the LERF by letter, dated September 22, 1999. Specifically, the variance allowed USDOE to monitor the groundwater in the vicinity of the LERF using only two downgradient monitoring wells. The September 22, 1999, letter indicated that the variance would be in effect for no longer than 18 months, or until one of the three remaining groundwater monitoring wells is unable to produce representative samples of groundwater. Furthermore, the same letter stipulated by the end of the variance, a permanent method for monitoring the LERF must be designed and implemented to fulfill final-status monitoring requirements. Finally, the variance explained that should a final-status monitoring program not be in place, Ecology would modify the permit by inserting final status monitoring conditions.

During a LERF workshop on May 31, 2000, it was agreed that the three options to satisfy LERF environmental monitoring requirements are: (1) groundwater monitoring (WAC 173-303-645), (2) unsaturated zone monitoring (WAC 173-303-655(6)), and (3) environmental monitoring exemption demonstration (WAC 173-303-650(2)(b)). USDOE representatives identified an intent to pursue an environmental monitoring exemption demonstration as provided by WAC 173-303-650(2)(b). Also, during the same meeting, USDOE representatives requested that their participation in the LERF environmental monitoring workshops satisfy Ecology's September 22, 1999, letter requirement to have designed and implemented a permanent method for monitoring the LERF by the end of the above-described variance. Ecology representatives explained that workshop participation alone would be insufficient to satisfy Ecology's September 22, 1999, letter requirement. Ecology representatives further explained that without the generation of an

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Ecology-approved environmental monitoring plan and/or demonstration, Ecology's waiver condition to have a final-status monitoring program in place by the end of the waiver period (no later than March 2001) stands.

During a LERF workshop on July 12, 2000, a discussion was held regarding criteria necessary to support USDOE's pursuit of an environmental monitoring exemption demonstration. Ecology representatives referred to the criteria specified by WAC 173-303-650(2)(b)(i), (ii), (iii), and (iv) and expressed a concern that substantial expenditures could be necessary to satisfy the demonstration criteria. Furthermore, Ecology representatives expressed a concern that the demonstration could be pursued at significant risk of not achieving the exemption as described/intended by WAC 173-303-650(2)(b). Therefore, Ecology believes it appropriate to first consider the environmental monitoring options, as described in the document entitled "Environmental Monitoring Alternatives for the Liquid Effluent Retention Facility" (PNNL-12024, M.D. Sweeney, November 1999). To facilitate this approach, Ecology has performed a review of the monitoring alternatives document and requests the following issues be addressed and/or evaluated:

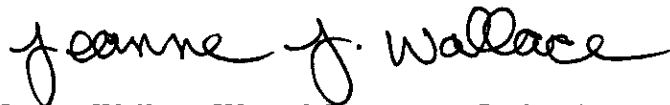
1. Electrical resistivity tomography (ERT) as a geophysical technique for leak detection does not appear to have been considered for monitoring at depth. It is recognized that the side wall slope and basin would make electrode installation difficult near the surface and in particular, directly beneath the LERF. The discussion of placement of electrodes at a "distance sufficient to limit disruption of the basins" was not described in sufficient detail for Ecology to understand spatial limitations. Therefore, it is requested that a detailed description of electrode placement satisfying basin disruption limitations, as well as noise reduction limitations be provided. In addition, it is requested that a graduated depth installation of ERT electrodes be considered.
2. Geophysical logging techniques for moisture detection using inclined drilling installation techniques do not appear to have been considered. Inclined drilling techniques have been successfully demonstrated at the Hanford Site. Therefore, it is requested that a detailed description of inclined drilling for moisture detection purposes be provided.
3. Soil-gas monitoring (tracer gas techniques) for waste constituents does not appear to have been considered to occur at depth. Ecology concurs with the report's recommendation to use soil-gas sampling in conjunction with either shear-wave seismic tomography or a system based on the principle of excitation of mass. Therefore, it is requested that a detailed description of soil gas boreholes/cone penetrometers with a graduated depth of installation be considered.
4. The report did not discuss monitoring programs that could be used to satisfy the intent of WAC 173-303-655(6) requiring the owner/operator to establish an unsaturated zone monitoring program. Ecology recognizes the physical limitations associated with monitoring directly beneath the unit (i.e., with lysimeters or an equivalent soil-liquid pore monitoring

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system). During the LERF groundwater workshop on July 12, 2000, Ecology representatives indicated the environmental monitoring intent of WAC 173-303-655(6) could be satisfied by designing an environmental monitoring system which tracks moisture and waste-specific contaminants through the vadose zone beneath and/or downgradient of the LERF. Therefore, it is requested that a description of an environmental monitoring system capable of tracking moisture and waste-specific contaminants through the vadose zone be described in relation to satisfying the intent of WAC 173-303-655(6).

If you have any questions regarding this letter or the requests contained herein, please contact Stan Leja at (509) 736-3046.

Sincerely,

A handwritten signature in cursive script that reads "Jeanne F. Wallace". The signature is written in dark ink and is positioned above the printed name and title.

Jeanne Wallace, Waste Management Project Manager  
Nuclear Waste Program

JW:sl:adh:sb

cc: Marvin Furman, USDOE  
Greg Sinton, USDOE  
John Fruchter, PNNL  
Stuart Luttrell, PNNL  
Mark Sweeney, PNNL  
Merilyn Reeves, HAB  
Mary Lou Blazek, OOE  
Administrative Record: LERF